REMARKS

A final Office Action was mailed on March 29, 2005. Claims 1 – 17 are currently pending in the application.

REJECTION UNDER 35 U.S.C. §§ 102, 103

Claims 1 – 9, 11 – 14, 16 and 17 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,512,741 to Kohzuki. Claim 10 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kohzuki in view of U.S. Patent No. 6,081,505 to Kilkki. Claim 15 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kohzuki in view of U.S. Patent No. 6,570,890 to Keenan et al. Applicants respectfully traverse these rejections.

In independent claims 1 – 6, 16 and 17, Applicants disclose a packet flow control apparatus and method for controlling a flow of packets each having variable length. In independent claim 1, for example, Applicants disclose:

> 1. A packet flow control apparatus performing flow control of packets each having variable length, comprising:
>
> a buffer memory for temporarily accumulating arrived packets until a sending time for each packet;
>
> a counter updated based on the length of an input packet and a rate determined by a limited flow of packets;
>
> a sending time determining means for determining the sending time of each packet based on the counter value and a present time; and
>
> a sending order control means for managing a sending order of each packet accumulated in the buffer memory, and for sending a read instruction of each packet to the buffer memory, based on the sending time determined by the sending time determining means;
>
> wherein the sending time determining means includes a memory means storing parameters for each of a plurality of control ~~unit~~ units to independently control packet flow, the parameters determining a state of change of the counter; when an input packet is written into the buffer memory, the sending time determining means obtains the sending time of the input packet based on the parameters read out from the memory means, the parameters corresponding to the control unit

controlling the input packet; and the sending time determining means updates the parameters based on a newly obtained sending time of the input packet, and transfers the newly obtained sending time of the input packet to the sending order control means.

(Emphasis added)

In our Response mailed January 5, 2005 to the Office Action of October 5, 2004, Applicants made the following arguments:

> Kohzuki discloses a traffic shaper for an ATM communications system (see, e.g., abstract of Kohzuki). With reference for example to FIG. 14 of Kohzuki, the Examiner suggests that packet buffer 1410 of Kohzuki corresponds to Applicants' claimed buffer memory, packet length identifier circuit 1499 corresponds to Applicants' claimed counter, calculation unit 1440 of Kohzuki corresponds to Applicants' claimed sending time determining means, and packet buffer read controller 1414 of Kohzuki corresponds to Applicants' claimed sending order control means (see, e.g., FIG.14 and column 19, line 39 through column 20, line 67 of Kohzuki).
>
> While Kohzuki discloses that packet length identifier circuit 1449 identifies packet length information which is used for determining a sending time, unlike Applicants' claimed invention, Kohzuki fails to disclose Applicants' claimed counter for assisting the sending time determining means in determining a sending time, and which is updated based both on a packet length and on a rate determined by a limited flow of packets.

The Examiner finds these arguments to be unpersuasive. Specifically, the Examiner suggests that, if packet length identifier circuit 1499 is considered to be equivalent to Applicants' claimed counter, an estimated sending time is determined by calculators 1441, 1431 based on packet length identifier circuit 1499 (see, e.g., FIG. 14 of Kohzuki). However, Applicants respectfully submit that Kohzuki none-the-less fails to meet Applicants' claim limitation requiring that the counter be updated both based on a packet length and on a rate determined by a limited flow of packets.

With reference to page 13, line 2 through page 19, line 1 of Applicants' specification and Applicants' FIGs. 2, 5 and 7, details of the claimed method of calculating a sending time sT are disclosed. The sending time sT is calculated as a function of a received packet length L, a rate R

corresponding to a limited flow of packets, a counter value C and a present time T. More specifically, the sending time sT is calculated as

$$sT = Max [pT + (L - pC/R, T)$$

where pT is a sending time of a preceding packet, pC is a counter value when the preceding packet is sent, and T is a present time. The counter value C is calculated as:

$$C = Min [B, pC + (sT - pT) \times R]$$

where B is an upper limit of the counter value. The rate R is a value showing a data flow per unit time (e.g., bytes/second) determined from a limited packet flow transmitted by a network. According to the present invention, the packet flow is controlled so that an amount of data transmitted within a certain time interval does not exceed an amount determined by the rate R (see, e.g., page 15, line 26 to page 19, line 1 of Applicants' specification and Applicants' FIG. 2).

In sharp contrast to Applicants' approach, Kohzuki discoses a packet length identifier circuit 1499 of FIG. 14 that does not calculate a counter value based on an input packet length L and a rate R corresponding to a limited flow of packets. In particular, Kohzuki discloses a sending interval calculated as:

Sending interval = (reference sending interval) x (sending IP packet length)

As evidenced by this calculation, an object of the method disclosed by Kohzuki is to cause sending intervals of ATM cells to be made constant in order to fulfill a contractual obligations for sending intervals of ATM cells when IP packets of variable length are divided into ATM cells of 53 bytes in a case where IP packets of variable length are transmitted through an ATM network having a 53 byte fixed length ATM network. As a result, and in contrast to

Applicants' claimed method, the method disclosed by Kohzuki cannot be used to control a packet flow that does not use the ATM network.

In summary, according to the present invention, the sending time of a packet and an associate counter value are calculated based on a rate determined from a limited flow of transmitted data, and packet sending flow control is carried out while packets are sent in a maximum efficiency within the above limited flow. As such an approach is applicable to any network handling variable length packets, the present invention as claimed in claim 1 is distinguished from Kohzuki both in construction and effect.

Accordingly, for the reasons cited above, Applicants respectfully submit that amended independent claim 1 is not anticipated by Kohzuki, and is therefore in condition for allowance. Applicants substantially reapply the above arguments to amended independent claims 2 – 6, 16 and 17, which include similar limitations in regard to the claimed counting operation. Accordingly, Applicants submit that amended claims 2 – 6, 16 and 17 are also in condition for allowance. As dependent claims 7 - 15 each depend from at least one of allowable claims 1 - 6, Applicants further submit that dependent claims 7 - 15 are allowable for at least this reason.

CONCLUSION

An earnest effort has been made to be fully responsive to the Examiner's objections. In view of the above amendments and remarks, it is believed that claims 1 – 17, consisting of independent claims 1 – 6, 16 and 17, and the claims dependent therefrom, are in condition for allowance. Passage of this case to allowance is earnestly solicited. However, if for any reason the Examiner should consider this application not to be in condition for allowance, he is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged on Deposit Account 50-1290.

Respectfully submitted,

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